



Technical Data Sheet

Electrical Line Integrity Monitoring Module

• INTELLIGENCE INSTALLED

A precise and accurate electrical cable integrity monitor for ungrounded electrical systems.



Long term operation and exposure to harsh environmental conditions causes insulation degradation in cables and other electrical equipment over time.

Building on over a decade of proven expertise with the original V-LIM unit, the V-LIM DIN has been engineered to deliver equal monitoring capability in a compact form factor. Its design enables seamless retrofit into legacy systems and straightforward integration into new control room equipment.

The V-LIM DIN provides precise and accurate measurements of insulation resistance, capacitance, and other advanced electrical parameters. V-LIM DIN provides not only a detailed view of the system's health over time but also opportunities to prevent problems before they occur. This is achieved through V-LIFE - an exclusive, patented feature for subsea applications that can be activated to increase system insulation resistance (IR), without the need for costly interventions or the risk of introducing new faults, reducing reliance on reactive measures following failures.

The V-LIM DIN employs digital signal processing techniques to facilitate the trending and characterisation of system conditions, providing reliable fault detection across a wide measurement range. It is fully compatible with power transmission systems, communication systems, and combined communication-on-powerline systems. Integration into existing or new infrastructure is straightforward, thanks to its DIN-mounting arrangement.

The V-LIM DIN features two independently adjustable alarms and relay contacts, which can be set to predefined, user-configurable thresholds. When the insulation resistance falls below these thresholds, the alarms are triggered, and the relays operate.

The V-LIM DIN provides a comprehensive view of system condition as a standalone unit, which can be interrogated via its touch-enabled LCD panel or easily downloaded using its USB A port.

Additionally, simultaneous measurement of cross-coupled channels is supported through the V-NET Sync protocol. This protocol is specifically designed to mitigate interference between units caused by cross-coupling via inherent mutual capacitance and resistance in systems with multiple channels, where each channel is monitored by an individual unit.

The V-LIM DIN's integrated memory allows the storage of timestamped system health and line-characterising parameters. By uploading this data to Viper Innovations' online portal, PlatformVi, users gain access to comprehensive insights, analytics, and personalised recommendations for the monitored system.

Key Features

- Smaller form factor allows seamless retrofit with legacy systems
- V-LIFE – Award winning cable rejuvenation technology
- Two separately configurable alarms with associated relay contacts to take desired action
- Timestamped measurement data is logged to internal memory
- Touchscreen LCD and web interface displays
- Ethernet, RS485 and 4-20mA interfaces
- Upload firmware and configuration settings from the front USB-A interface via a memory stick
- Download data log to memory stick
- Compatible with temporary application of external IR test unit without physical disconnection of V-LIM DIN
- Multiple user security levels supported for secure access
- Facility to disconnect the V-LIM DIN from the line monitored
- Cross-coupling immunity provided by V-NET Sync feature, enabling multiple V-LIM DIN units to take accurate simultaneous measurements on adjacent cables by eliminating affects of cross-coupled electrical noise
- Coupler Module connection capability for voltage >1kV
- Built-in self-test

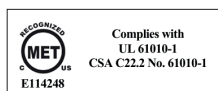
Product Standards

BS EN / IEC 61557-1
 BS EN / IEC 61557-8
 BS EN / IEC 61010-1
 BS EN / IEC 61010-2-30
 BS EN / IEC 61326-1
 BS EN / IEC 61326-2-4
 BS IEC 60533

Industry Standards

API 17F
 ISO 13628-6

Product Marks



Notice: Product complies with Part 15 of the FCC rules, subject to the following two conditions: 1. The device may not cause harmful interference. 2. This device must accept any interference received, including interference that may cause undesired operation.

Electrical

Supply Voltage:	24 V DC ± 20% tolerance
Power Consumption:	5 W typical 8 W maximum
Line Voltage:	Up to 1000 V DC / AC 47-410 Hz
Line Capacitance (operating):	Up to 500 µF

Mechanical

Environmental:

Operating Temperature Range:	-20° C to +60° C (-4° F to +140° F)
Storage Temperature Range:	-40° C to +70° C (-40° F to +158° F)
Relative Humidity:	Up to 85% non-condensing
Pollution Degree:	BS EN 61010-1: Degree 2
Relay Overvoltage Category:	CAT II
Measurement Category:	BS EN 61010-2-030:2010 CAT III

Packaging:

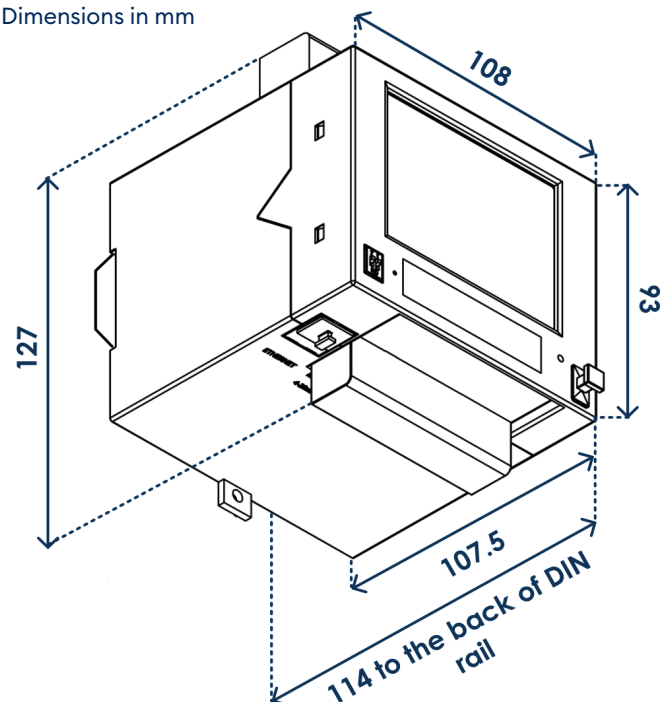
Dimensions:	See diagram below
Weight:	0.5 kg

Data storage

Circular FIFO buffer
 Typical two year data storage without overwrite @ one reading per minute.

Mounting Arrangement

Dimensions in mm



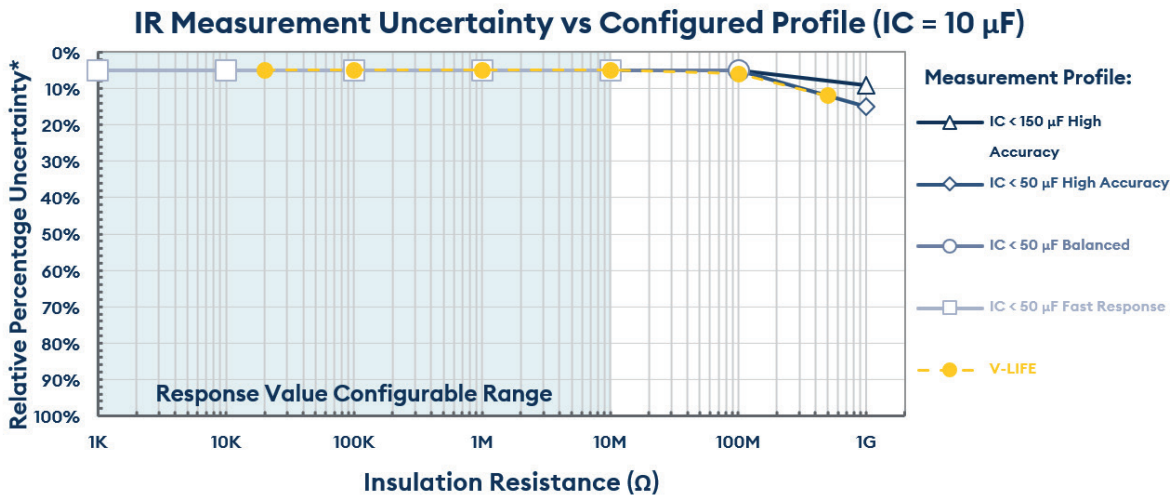
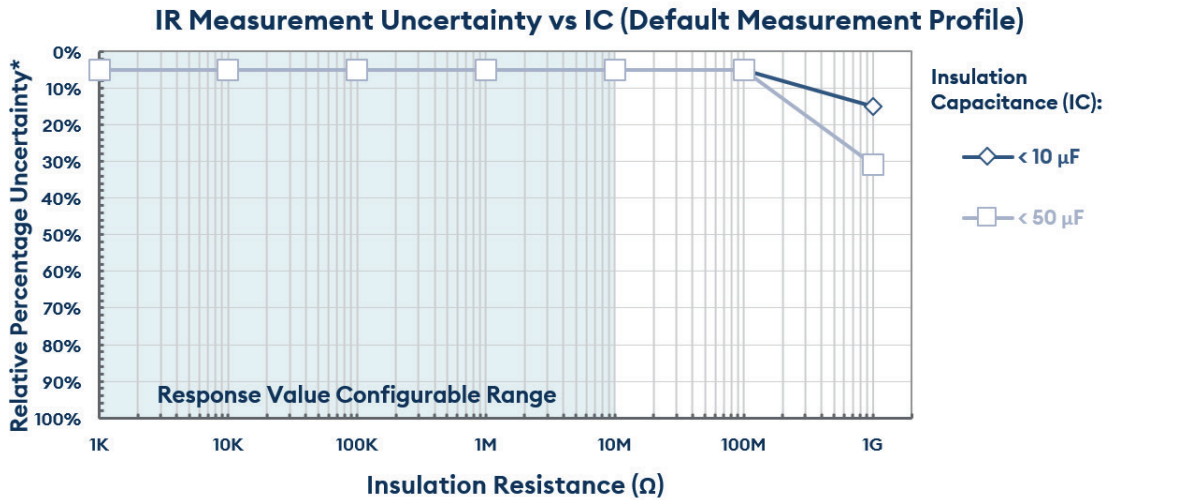
viperrinnovations.com/v-lim

Measurement

Insulation Resistance:

1 kΩ to 1 GΩ* @ see graphs below

* The maximum IR changes depending on the measurement profile selected. When V-LIFE is enabled, the IR range is between 20 kΩ and 500 MΩ.



Note: Measurement relative percentage uncertainty is specified in the form $\pm YY\%$ of reading \pm offset, where YY is the tolerance taken from the applicable graph on the Y-axis. The offset is ± 1 kΩ for standard V-LIM measurement profiles and ± 15 kΩ when V-LIFE is enabled. The relative uncertainty values were obtained under controlled laboratory conditions corresponding to BS EN / IEC 61557-8 reference conditions with various IC values.

Response Value (Alarms)¹:

1 kΩ to 10 MΩ

Line Voltage (True RMS):

50 to 1000 V AC @ $\pm 3\% \pm 5$ V

Insulation Capacitance:

0.1 μF to 150 μF @ $\pm 25\% \pm 0.05$ μF

Line Frequency:

AC 47 – 410 Hz @ $\pm 1\% \pm 0.5$ Hz

¹ Based on IEC61557-8 reference conditions

Interfaces

Connection:

- Screw terminal connectors (supplied)
- RJ45 Ethernet

Alarms:

- 2 x Single pole volt-free changeover contacts compatible with signals up to 240 V AC / 220 V DC, 2 A
- 60 W, 62.5 VA maximum switching power
- User configurable non-failsafe (default) and failsafe modes

Ethernet:

- 10/100 Base-TX Auto negotiation
- DHCP / static (configurable) IP addressing
- Modbus TCP/IP, HTTP protocols supported

RS485:

- 9600, 19200, 38400, 57600, 115200 bps
- Modbus RTU

USB:

- USB 2.0 Type-A data download and configuration update via memory stick

Current Loop:

12 V to 24 V DC input voltage required.
Multiple configurable Linear IR Ranges:

- 0 Ω (4 mA) - 1 GΩ (20 mA)
- 0 Ω (4 mA) - 500 MΩ (20 mA)
- 0 Ω (4 mA) - 100 MΩ (20 mA)
- 0 Ω (4 mA) - 10 MΩ (20 mA)
- 0 Ω (20 mA) - 10 MΩ (4 mA) Inverted
- 0 Ω (4 mA) - 1 MΩ (20 mA)
- 0 Ω (20 mA) - 1 MΩ (4 mA) Inverted
- 0 Ω (4 mA) - 100 kΩ (20 mA)

Two configurable non-linear IR ranges for Legacy systems.

Digital Switch Input:

- 1 x volt-free digital switch input
- Configurable trigger modes (NO/NC) and 5 different functions

LCD:

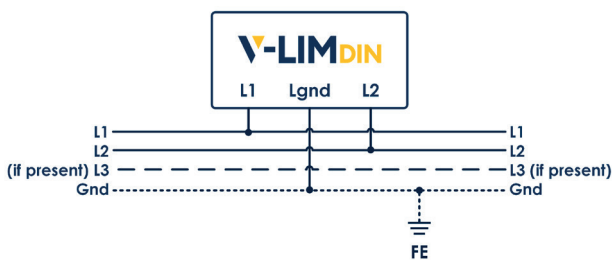
- 640 x 480 touch screen

Order Codes:

- VA-232048 V-LIM DIN (V-LIFE capable)

Full list of installation accessories is available upon request.

AC connection



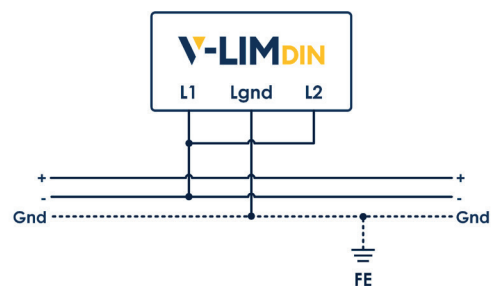
Description:

The V-LIM DIN is connected to each line conductor (L1 and L2) and associated ground.

Measurements available:

- Insulation Resistance
- Insulation Capacitance
- Line Voltage
- Line Frequency

DC connection



Description:

The V-LIM DIN is connected to one line conductor (via L1 and L2) and associated ground.

Measurements available:

- Insulation Resistance
- Insulation Capacitance

Note: Refer to the V-LIM DIN Installation and Operating Manual 6256-147299 for more detailed information.



Get in touch:

viperinnovations.com/contact

viperinnovations.com/v-lim